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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/572,745	03/21/2006	Toshikazu Takada	0403730375	3314

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FOLEY AND LARDNER LLP
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007

EXAMINER	
DEJONG, ERIC S	

ART UNIT	PAPER NUMBER
1631	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/572,745	TAKADA ET AL.	
	Examiner	Art Unit	
	ERIC S. DEJONG	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 March 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED OFFICE ACTION

Claims 1-14 are pending and currently under examination.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 04/24/2006 is acknowledged and has been considered by the examiner. Accordingly, a copy of the signed and initialed PTO-form 1449 has been included with this Office action.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-6, 13, and 14 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The recent en banc decision regarding Bilski v. Warsaw (2008) set forth that a process is patent-eligible if (1) it is ties to a particular machine or apparatus or (2) it transforms a particular article into a different state or thing. Further, the recent decision in Comiskey (2009) confirmed the opinion set forth in Bilski of the prohibition pre-empting an abstract idea or mental process in a claim. The revised Comiskey decision further reiterated the president set forth in Richman, 563 F.2d 1026, 1030 (CCPA 1977) wherein the court held the application unpatentable because “if a claim [as a whole] is

directed essentially to a method of calculating, using a mathematical formula, even if the solution is for a specific purpose, the claimed method is nonstatutory."

In the instant case, the claims are directed to a method for executing calculation of a Hartree-Fock method in a molecular orbital. The recited process comprising dividing a density matrix into multiple submatrixes, distributing and storing the submatrixes, and executing calculation processes on the multiple density submatrixes. However, the recited process does not involve any transformation of a particular article into a different state or thing. Rather, the instant claims are directed to abstract data manipulation and mathematical operations on an unspecified density matrix. Therefore, the examiner must determine if the instant claims are tied to a particular machine or apparatus. It is acknowledged that the instant claims recite using a plurality of computer to perform the recited matrix operations, however this only suggests the involvement of a general purpose computer in carrying out the recited process and does not specify any particular structure or machine or apparatus elements that are required in order to carry out the recited process. As such, the instant claims are directed essentially to a method of calculating and performing a mathematical operations, and, therefore, said claims are directed to nonstatutory subject matter.

Claim 13 is directed to a computer program, per se. A computer program does not fall into any of the identified statutory categories of invention. Further, in the Supreme Court decision of Gottschaulkv. Benson (1972), the court found that, while a computer programs may be eligible for copyright protection, they are not considered

statutory subject matter under 35 § USC 101. Therefore, since claim 13 is directed to a program, per se, it is not statutory subject matter.

Claim 14 is directed to a computer readable media. Upon review, the instant specification sets forth the non-exhaustive examples of computer readable media as magnetic tape, CD-ROM, or via a network (see page 23 of the instant specification). In the instant case, the recited computer media is generic and not limited to only physical embodiments. Rather, said claims are open to signal and carrier embodiments. With regard to signal and carrier wave computer media embodiments, the CAFC set forth in the In re Nuitgen (2007) decision that transient embodiments of computer readable media such as signals and carrier wave are not statutory subject matter. Therefore, claim 14, which encompasses signal and carrier wave embodiments, encompass non-statutory subject matter.

In the instant case, claim 14, which depends from claim 13, is directed to a computer readable media, which is can be classified in the statutory category of a product. Claim 13 is directed to a computer program, which does not fall into any recognized statutory category of invention under 35 USC 101. As such, claim 14 is not directed to a product due to it's depends from claim 13, which is directed to a computer program. With regard to a single claim that overlaps or embraces different classes of invention, the BPAI decision in Ex parte Lyell (1990) held that such claims are ambiguous and should be rejected under 35 USC 101 and 112, second paragraph, because they do not satisfy 35 USC 101 which is drafter so as to set forth the statutory

classes of invention in the alternative only. Therefore claim 14 is rejected under 35 USC 101 as not being directed to a single category of invention, but rather embracing an overlap of classes of invention. See also the rejection of claims under 35 USC 112, second paragraph below.

For the benefit of applicants, an amendment to the instant claims 13 and 14 so as to combine said claims into a Beauregard form, e.g. a computer readable media comprising computer program…, would be sufficient to overcome the instant rejection.

Claims 1-14 are rejected under 35 U.S.C. 101 because the claimed invention is lacks patentable utility.

The instant claims are drawn to a method, and the related computer program and system, of using a computer cluster, dividing a density matrix into multiple submatrixes, and executing calculation processes. While it is acknowledged that the preamble of the independent claim 1 suggests calculations of the Hartree-Fock method in a molecular orbital, the instant claims do not recite any positive limitation that would limited the executed "calculation processes" to a Hartree-Fock method. Rather, the instant claims are generic with respect to the types of calculation processes that are encompasses by the recited method, program, and systems. The instant claims do not recite any limitation directed to the "molecular orbital" that a density matrix is derived from, nor the type of molecular systems that the recited computational processes. Further, the instant claims do not recite any particular improvement or how the recited calculation processes would be used to yield any useful information that can be considered to have

both a specific and a substantial utility. As such, the instant claims are generic with regard to what molecules or class of molecules systems the recited “calculation processes” operate on or what particular molecular characteristics and/or features would be identified by a practitioner of the claimed invention.

The Court of Patent and Appeals has stated:

> "Practical utility is a shorthand way of attributing "real-world" value to claimed subject matter. In other words, one skilled in the art can use a claimed discovery in a manner which provides some immediate benefit to the public." A ‘use’ to do further research is not considered a utility which provides an "immediate benefit" to the public.
> Examples of situations requiring further research to identify or reasonably confirm a "real world" context of use, and which do not have utility under 35 USC 101, as set forth in MPEP 2107.01.1, include:
> (A) Basic research such as studying the properties of the claimed product itself or the mechanisms in which the material is involved',
> (B) A method of treating an unspecified disease or condition,
> (C) A method of assaying for or identifying a material that itself has no specific and/or substantial utility,
> (D) A method of making a material that itself has no specific, substantial and credible utility, and
> (E) A claim to an intermediate product for use in making a final product that has no specific, substantial, and credible utility.

In the instant case, practicing the claimed invention result only in the execution of unspecified calculation processes and unspecified computation results generated therefrom. The instant claims are not limited to any particular molecule or field of study, but rather to carrying out unspecified computations on an unspecified system of interest. Such amounts to basic research on an unspecified molecule or molecular systems so as to investigate the potential properties thereof. As noted in the utility guidelines (see Federal Register, December 21, 1999, Vol. 64, No. 244), basic research directed only towards potential properties. Therefore, the instant claims do not have a specific or substantial utility.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-14 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 8-12 and 14 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 8-12, which depend from claim 7, are directed to a parallel computing system. Dependent claims 8, 9, 11, and 12 each recite the active process step of individually dividing submatrixes causing density suubmatrixes to transfer. Dependent claim 10 recites the active process step of partially executing two-electron integration. This causes the metes and bounds of the instant claim to be indefinite because a recitation of how to use an apparatus fails to and any meaningful limit on the structure of the system that is set forth in independent claim 7. As such, dependent claims 8-12 do

not further limit the apparatus encompassed by said independent claim, but rather appear to further define by it's process of use.

Claim 14, which depends from claim 13, is directed to a computer readable media, which is can be classified in the statutory category of a product. Claim 13 is directed to a computer program, which does not fall into any recognized statutory category of invention under 35 USC 101. As such, claim 14 is not directed to a product due to it's depends from claim 13, which is directed to a computer program. With regard to a single claim that overlaps or embraces different classes of invention, the BPAI decision in Ex parte Lyell (1990) held that such claims are ambiguous and should be rejected under 35 USC 101 and 112, second paragraph, because they do not satisfy 35 USC 101 which is drafter so as to set forth the statutory classes of invention in the alternative only. Therefore claim 14 is rejected under 35 USC 112, second paragraph, as being indefinite because it is not directed to a single category of invention, but instead ambiguously embraces an overlapping classes of invention. See also the rejection of claim 14 under 35 USC 101, set forth above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIC S. DEJONG whose telephone number is (571)272-6099. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marjorie Moran can be reached on (571) 272-0720. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ERIC S. DEJONG/
Primary Examiner, Art Unit 1631